FIG.1

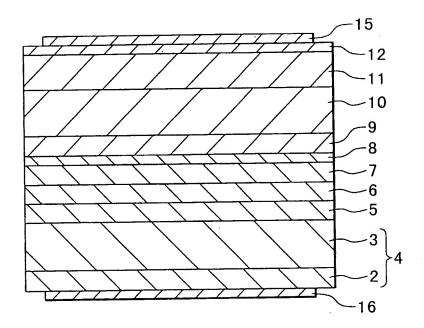


FIG.2A

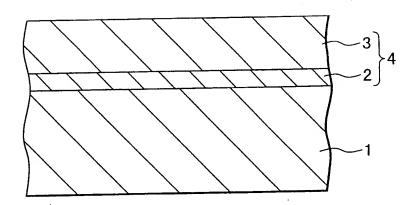


FIG.2B

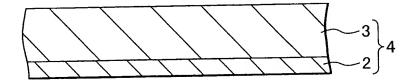


FIG.3

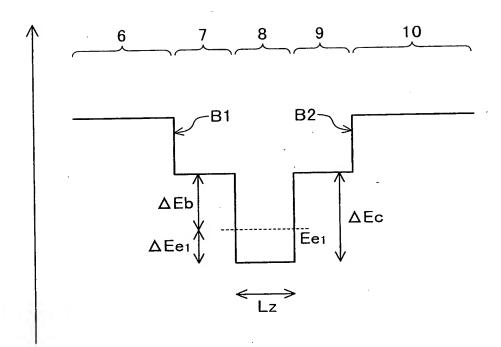


FIG.4

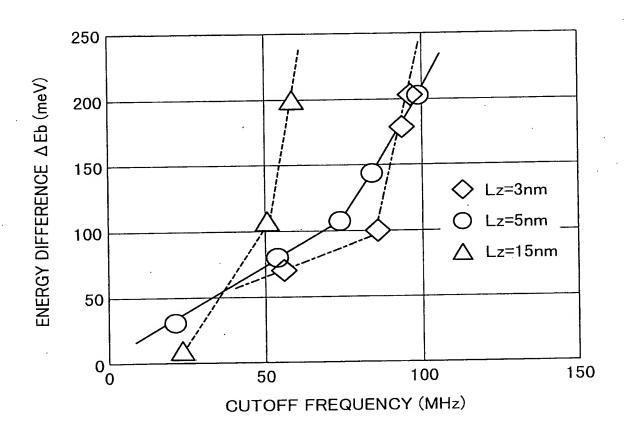


FIG.5

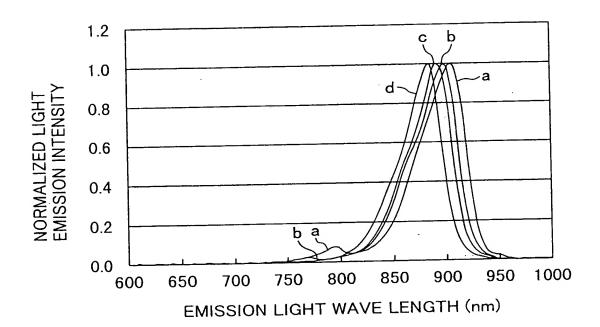
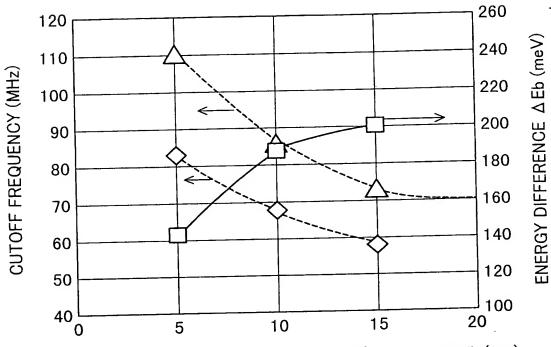
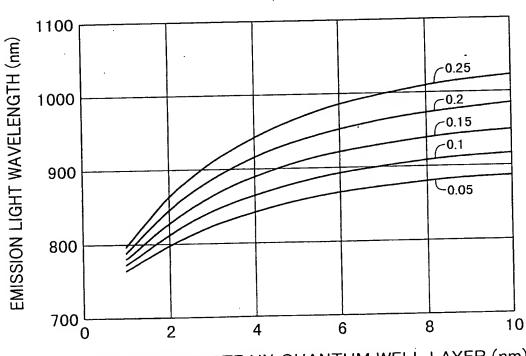


FIG.6



THICKNESS Lz OF STRAIN QUANTUM WELL LAYER (nm)

FIG.7



THICKNESS OF STRAIN QUANTUM WELL LAYER (nm)

FIG.8

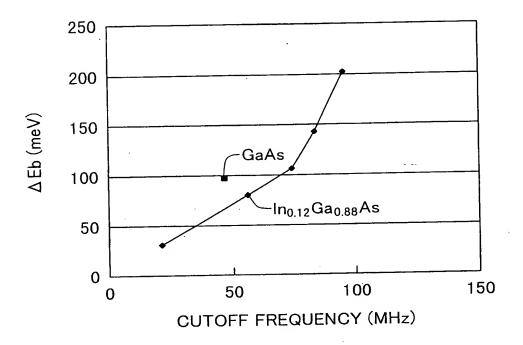


FIG.9

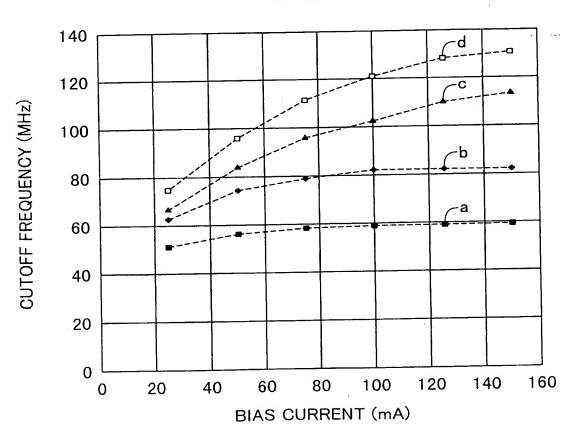
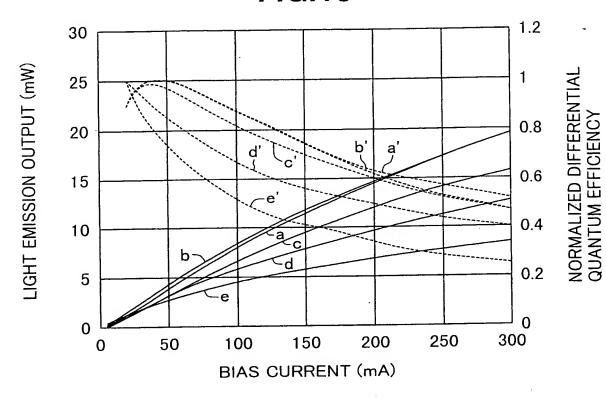


FIG.10





1

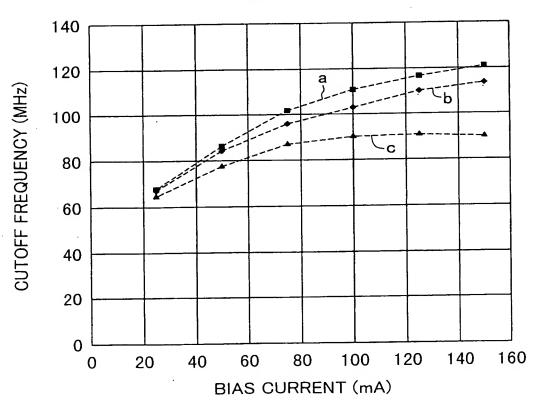


FIG.12

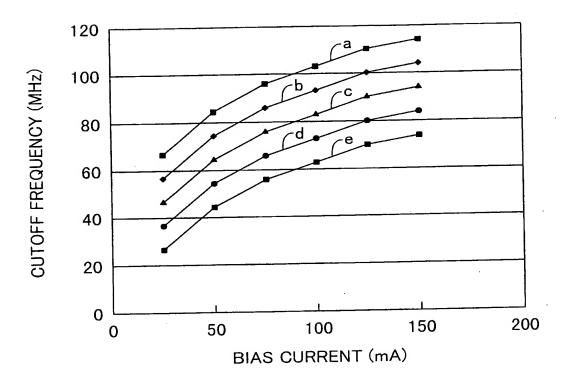


FIG.13

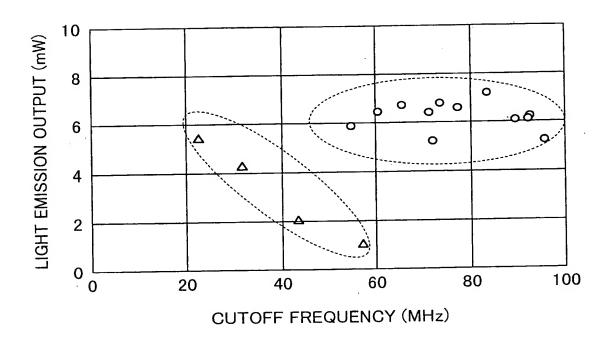
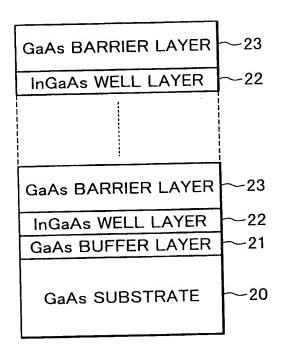


FIG.14



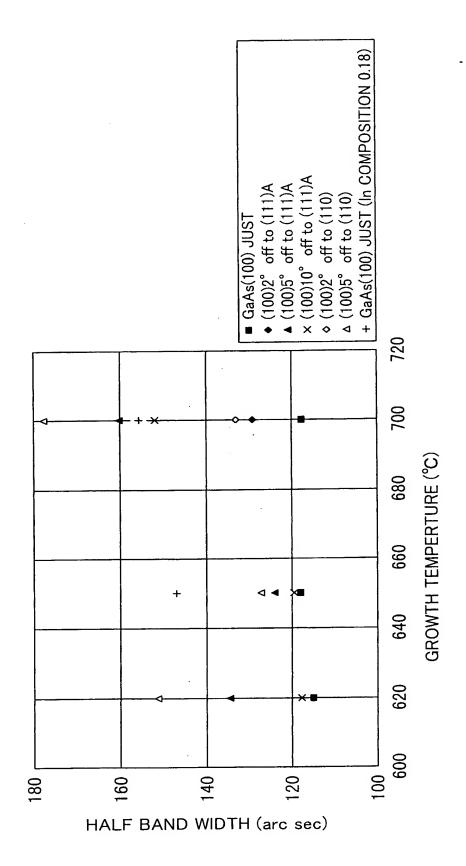


FIG.16A

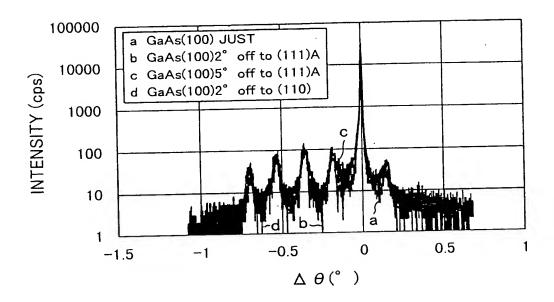
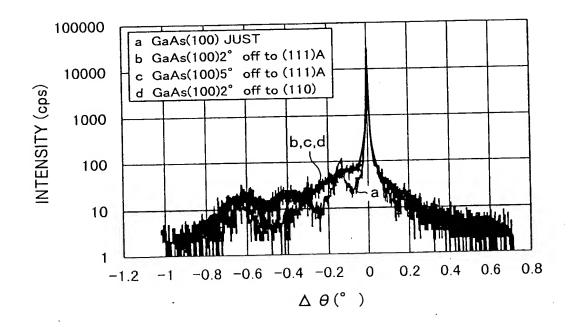


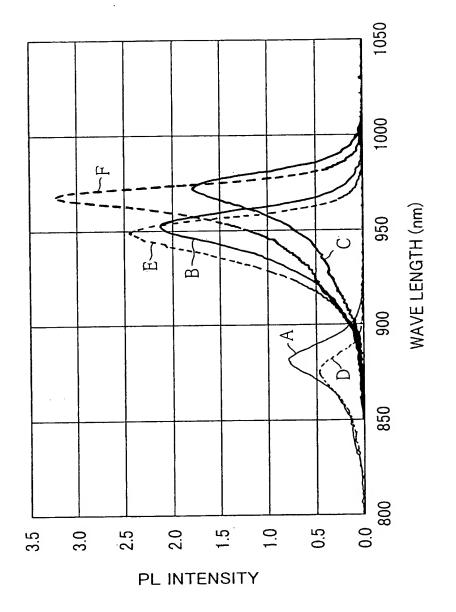
FIG.16B



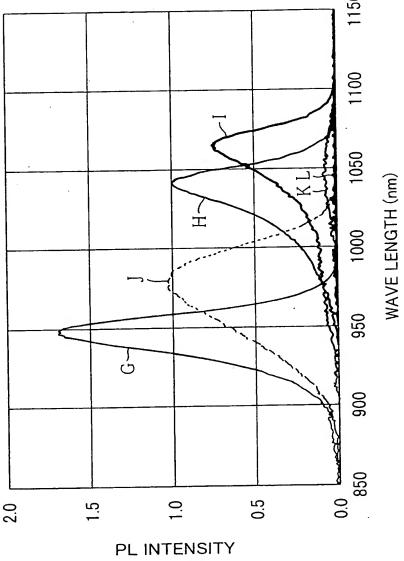
GaAs CAP LAYER	~37
Al <sub>0.39</sub> Ga <sub>0.61</sub> As CLAD LAYER	~-36
Al <sub>0.26</sub> Ga <sub>0.74</sub> As CARRIER CONFINEMENT LAYER	~35
InGaAs WELL LAYER	~34
Al <sub>0.26</sub> Ga <sub>0.74</sub> As CARRIER CONFINEMENT LAYER	~33
Al <sub>0.39</sub> Ga <sub>0.61</sub> As CLAD LAYER	~32
GaAs BUFFER LAYER	~-31
GaAs SUBSTRATE	~30

			Т	T		T					T		
SHRSTRATE	00000	GaAs(100) JUST	GaAs(100) JUST	GaAs(100) JUST	GaAs(100)5° off to (111)A	GaAs(100)5° off to (111)A	GaAs(100)5° off to (111)A	GaAs(100) JUST	GaAs(100) JUST	GaAs(100) JUST	GaAs(100)5° off to (111)A	GaAs(100)5° off to (111)A	GaAs(100)5° off to (111)A
WELL LAYER	THICKNESS (nm)	5	10	15	5	10	15	5	10	15	5	10	15
InGaAs QUANTUM WELL LAYER	In COMPOSITION RATIO	0.12	0.12	0.12	0.12	0.12	0.12	0.18	0.18	0.18	0.18	0.18	0.18
	SAMPLE	A	В	O	Q	ш	L	5	I		7	ス	

FIG. 19







<b>49</b>	
Ge/Au ELECTRODE	1
Si-GaAs CONTACT LAYER	~-48
Si-Al <sub>0.18</sub> Ga <sub>0.82</sub> As CURRENT DIFFUSION LAYER	<b>~</b> 47
Si-Al <sub>0.39</sub> Ga <sub>0.61</sub> As CLAD LAYER	<b>~</b> 46
Al <sub>0.26</sub> Ga <sub>0.74</sub> As CARRIER CONFINEMENT LAYER	<b>~</b> 45
InGaAs WELL LAYER	~44
Al <sub>0.26</sub> Ga <sub>0.74</sub> As CARRIER CONFINEMENT LAYER	<del>-</del> 43
Zn-Al <sub>0.39</sub> Ga <sub>0.61</sub> As CLAD LAYER	<b>~</b> 42
Zn-GaAs BUFFER LAYER	<b>~</b> 41
Zn-GaAs SUBSTRATE	4(
AuZn ELECTRODE	50

		ITINAL IO SASOSI	COAS OLIANITIM WELL AVER		HALF BAND	CUTOFF
		INGRAS GOAN O	WI WELL LAILEN	_	WINTH (nm) OF	FREQUENCY
SAMPLE	SUBSTRATE	In COMPOSITION THICKNESS (nm)	THICKNESS (nm)	(mW)	EL SPECTRUM	(MHz)
3	GaAs(100) JUST	0.12	ഹ	2.2	46.3	81.9
					L L	000
×	GaAs(100)5° off to (111)A	0.12	വ	2.1	97/9	19.0
					C C	100
>	GaAs(100) JUST	0.25	က	2.0	20.8	100.1
					000	00+
2	GaAs(100)5° off to (111)A	0.25	က	<del>.</del>	99.9	112.3
!						

900 950 1000 1050 1100 1150 1200 WAVE LENGTH (nm) 820 800 750 0.0 L 700 0.2 0.8 9.0 0.4 0. NORMALIZED EL INTENSITY

FIG.24

